Muelleria 12(2):217-221 (1999)

A New Species of *Pseudocyphellaria* (Lichenised Fungi), With a Key to the Tasmanian Species

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Abstract

Pseudocyphellaria sorediosglabra Kantvilas and Elix is described. The new species is endemic to Tasmania and differs from its nearest relative, *P. glabra* (Hook.f. & Taylor) Dodge, its marginally granular-sorediate lobes. A key to all 18 species of *Pseudocyphellaria* in Tasmania is provided.

Introduction

In preparation for a review of the composition, distribution and conservation status of the Tasmanian lichen flora (Kantvilas in prep.), we are describing a new species of *Pseudocyphellaria*.

Pseudocyphellaria is a very prominent and diverse genus of conspicuous, large, foliose lichens, especially in the Southern Hemisphere. Considerable information on the morphology, anatomy, biogeography and ecology of the genus has been published, especially in the major regional revisions for New Zealand (Galloway 1988), South America (Galloway 1992) and the palaeotropics (Galloway 1994).

Eighteen species are known from Tasmania, a relatively low level of diversity in comparison to New Zealand where 50 species are known (Malcolm & Galloway 1997). Most Tasmanian species (15) occur in high rainfall areas, especially in cool temperate rainforest and associated vegetation types such as wet scrub, alpine heathland and some wet sclerophyll forests (Kantvilas 1995). However, one species, *P. neglecta*, is confined to eucalypt forest, especially in low rainfall areas, whereas another, *P. aurata*, is confined to coastal swamps. The new species is also a non-rainforest lichen.

The closest relationships of the Tasmanian species of *Pseudocyphellaria* are with New Zealand and mainland Australia, with 15 of the 18 Tasmanian species being shared with these regions. In contrast, only ten of the taxa occur in South America. Two species are endemic to Tasmania: *P. brattii* and the new species, an unusually low level of endemism in comparison to, for example, southern South America, where 72% of the species are endemic (Galloway 1992) and New Zealand, where approximately half are endemic (Galloway 1988).

Materials and Methods

The study is based on collections in the Tasmanian Herbarium (HO) and the authors' field observations in Tasmania. Chemical analyses follow standard methods (Culberson 1972; Elix & Ernst-Russel 1993; Feige *et al.* 1993).

Pseudocyphyllaria sorediogabra Kantvilas & Elix, sp. nov.

Species habitu et compositione chemicali *Pseudocyphyellariae glabrae* proxissima, marginibus loborum dense sorediatis granularibus manifeste differt.

Type: Australia, Tasmania, ridge east of Ouse River, 4.5 km west of Liawenee, 41°54'S, 146°37'E, on dolerite rocks in alpine heathland, 1140 m altitude, 7 December 1993, *J.A. Elix 40061 & G. Kantvilas 184/93*. (holotype HO; isotypes CANB, BM).

Thallus irregularly spreading or rosette-forming, to c. 20 cm wide when well developed, loosely attached and easily separable from the substratum. *Lobes* very variable, imbricate throughout or ± discrete, strap-like and contiguous, and radiating towards the thallus margins, 35–120 mm long, (3–)7–13 mm wide, rather leathery and robust, 200–400 µm thick; apices ± irregularly rounded, crenulate, ± adnate to the substratum or slightly ascending; margins ascending, crenate, irregularly incised, or at times, sinuate, densely and ± continuously sorediate except near the lobe apices; soredia whitish or pale yellowish-white, coarsely granular to granular-glomerulate, sometimes ± pseudoisidiate. *Upper surface* pale yellow to yellowish-green, sometimes discoloured brownish in the thallus centre, undulate, smooth to weakly scrobiculate in older lobes, glossy, glabrous, emaculate. *Lower surface* black centrally, becoming dark brown or pale brown towards the lobe apices, smooth to weakly wrinkled, occasionally bullate in older parts, with dense, dark brown to brown tomentum c. 0.3–0.6 mm long, composed of tangled hyphae, 6–14(–20) µm thick, typically continuous and extending almost to the lobe apices, but sometimes rather patchy in the centre of the thallus. *Pseudocyphellae* confined to the lower surface, white, scattered, few to numerous, especially in younger lobes, roundish, to 0.25–0.7 mm wide, plane, not excavate, sometimes slightly elevated in conical verrucae, or nestling amongst tomental hyphae. *Medulla* white. *Photobiont* a unicellular green alga with globose cells, 10–14 µm diam. *Apothecia* unknown (Fig. 1)

Chemistry: hopane-15α, 22-diol (major), 7β-acetoxyhopane-22-ol (major), stictic acid (major), constictic acid (minor), cryptostictic acid (minor), norstictic acid (trace), usnic acid (minor); medulla Pd+ orange, K+ yellow, C-, KC-, UV-.

Remarks: *Pseudocyphellaria sorediosglabra* is most closely related to the widespread austral species, *P. glabra*, both lichens having a yellowish thallus with broadly rounded, spreading, adnate lobes and a dark brown tomentum on the lower surface, a white medulla, white pseudocyphellae, a green photobiont and identical chemical composition. The new species differs in having copiously sorediate margins, whereas *P. glabra* is isidiate. In general, soredia are uncommon amongst *Pseudocyphellaria* species with a

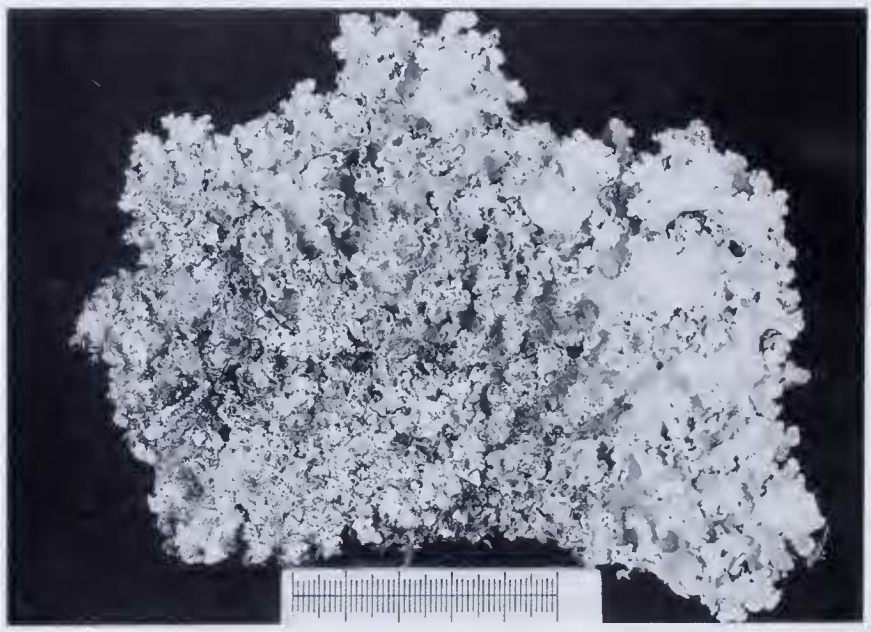

Fig. 1. *Pseudocyphellaria sorediosglabra* holotype (Scale in mm)

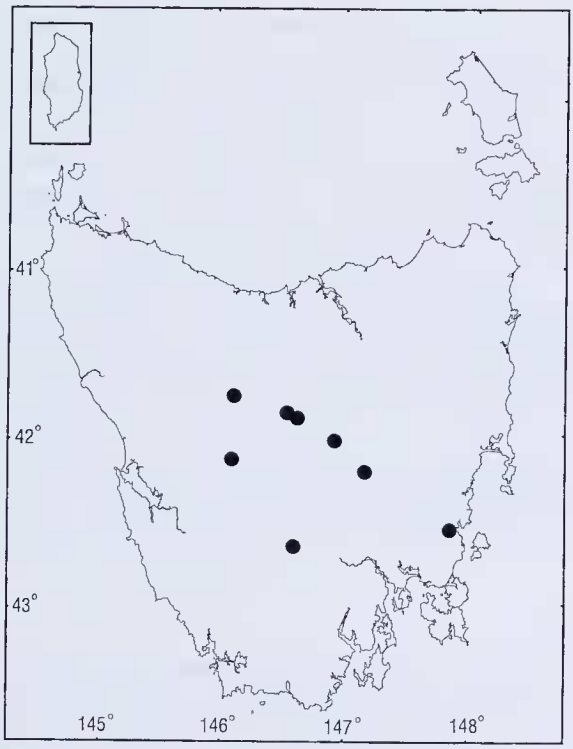

Fig. 2. Distribution of *Pseudocyphellaria sorediogłabra*.

green photobiont and white medulla. In the austral and Australasian regions, there is only one additional sorediate taxon, *P. granulata*, which differs in having a grey-green upper surface, rather elongate, faveolate lobes and a completely different chemical composition. The soredia of both this lichen and the new species may be particularly coarse and at times become virtually pseudoisidiate (see also Galloway 1992: 35).

Pseudocyphellaria sorediogłabra is known only from Tasmania where it occurs in open eucalypt woodland and heathland, especially at subalpine to alpine altitudes (see Fig. 2). It occurs mostly on dolerite rocks, and more rarely on wood or bark, associated with *Cladia aggregata*, *Parmelina labrosa*, *Usnea torulosa*, *Pseudocyphellaria crocata*, *P. glabra* and *Parmelia signifera*.

Specimens examined: AUSTRALIA, TASMANIA: Table Mountain, 42°14'S, 147°08'E, 1095 m altitude, *G.C. Bratt & J.A. Cashin 72/435*, 18.vi.1972 (AD, HO); Prosser River, 42°34'S, 147°52'E, *G. Kantvilas 312/80*, 23.viii.1980 (BM, HO); Mt Rufus, 42°07'S, 146°07'E, 1120 m altitude, *G.C. Bratt & J.A. Cashin 72/1002*, 8.x.1972 (HO); Lake Dobson, 42°42'S, 146°36'E, 1030 m altitude, *G.C. Bratt & D. Norris 73/1160*, 17.xi.1973 (HO); Mt Penny West, 42°02'S, 146°56'E, 1130 m altitude *G.C. Bratt & K.M. Mackay 69/166*, 4.iv.1969 (HO); Arm River Track, 41°48'S, 146°08'E, 800 m altitude, *D. & M. Cook 75/252*, ii.1975 (HO); Little Split Rock, 41°49'S, 146°31'E, 1240 m altitude, *A. Moscal 6691, 6692*, 1.iii.1984 (HO).

Key to Tasmanian species of *Pseudocyphellaria*

1. Medulla yellow 2
1. Medulla white (pseudocyphellae and soralia may be yellow or white) 6

2. Thallus sorediate; soralia yellow 3
2. Thallus not sorediate 5

3. Upper surface thickly tomentose; photobiont green: soralia marginal and laminal..... ..... *P. rubella*
3. Upper surface not tomentose; photobiont green or blue-green; soralia marginal only. 4

4. Photobiont blue-green; upper surface grey when dry, bright slatey blue-grey when wet; found in rainforest and wet scrub ..... *P. ardesiaca*
4. Photobiont green; upper surface grey when dry, becoming pale reddish brown in storage, bright green when wet; found in coastal swamps ..... *P. aurata*

5. Lobes ± elongate, with incised-serrate margins; isidia present, mainly marginal but sometimes also laminal; apothecia to 3–4 mm diam., with serrate, ± isidiate margin and redddish brown disc; medulla acetone+ orange-yellow or yellow ..... *P. colensoi*
5. Lobes ± rounded, with entire margins; isidia absent; apothecia 1–1.5 mm diam., with ± crenulate margin and ± black disc; medulla acetone+ magenta ..... *P. coronata*

6. Thallus dark blue-green when wet, blue-grey, brown-grey or dark red-brown when dry; photobiont blue-green 7
6. Thallus green, green-grey or pale yellow-green when wet or dry; photobiont green... 13

7. Thallus sorediate 8
7. Thallus not sorediate 9

8. Pseudocyphellae yellow; soralia yellow; thallus usually brown when dry... *P. crocata*
8. Pseudocyphellae white; soralia white, pale violet or bluish grey; thallus usually blue-grey when dry ..... *P. intricata*

9. Pseudocyphellae yellow; thallus usually brown when dry 10
9. Pseudocyphellae white; thallus brown or blue-grey when dry 11

10. Thallus with marginal and laminal phyllidia; common on rocks or soil, especially in dry sclerophyll forest ..... *P. neglecta*
10. Thallus lacking phyllidia; rather rare on rocks or tree buttresses, mainly in wetter habitats ..... *P. gilva*

11. Thallus with coralloid, marginal and laminal isidia, and with minute, punctiform pseudocyphellae on the upper surface ..... *P. argyracea*
11. Isidia absent or when present, not coralloid; pseudocyphellae confined mostly to the lower surface 12

12. Marginal phyllidia or ± flattened, dissected isidia present; thallus fragile, thin and papery, ± broadly lobed, glabrous on the upper surface, with raised margins; usually on rocks, logs or tree buttresses, common ..... *P. dissimilis*
12. Phyllidia or isidia absent or sparse; lobes elongate, narrow and richly divided, sometimes minutely tomentose and maculate near the tips, frequently bearing green leaflets of *Pseudocyphellaria multifida*; usually in deep shade on logs or epiphytic, uncommon ..... *P. brattii*

13. Upper surface pale yellow-green when wet or dry; lower surface dark brown; lobes ± rounded at the tips 14
13. Upper surface grey-green when dry, dark green or bright lettuce green when wet (rarely suffused brownish or blackish); lower surface cream to dark brown; lobes elongate, linear, with ± truncate tips 15

14. Lobes with marginal, easily abraded isidia; very common polymorphic species on trees, rocks and logs ..... *P. glabra*
14. Lobes with coarse marginal soredia; rather uncommon, on rocks ..... *P. soredioglabra*

15. Thallus coarsely granular sorediate; soralia marginal and laminal, ± concolorous with the upper surface of the thallus ..... *P. granulata*
15. Thallus not sorediate 16

16. Upper surface of thallus smooth to undulate; lobes much divided, with folioles or small, lateral lobes along the margin; branching ± random; undersurface cream to light brown; apothecial disc red-brown ..... *P. multifida*

16. Upper surface markedly faveolate; marginal folioles absent; branching ± dichotomous; apothecial disc dark brown or black 17

17. Individual faveolae usually as broad as the lobes; marginal pseudocyphellae absent; apothecia mainly marginal; undersurface dark brown or sometimes fawn, particularly at the tips of the lobes; tomentum frequently patchy; lacking physciosporin..... ..... *P. billardierei*

17. Usually several faveolae spanning the width of the lobes; marginal pseudocyphellae present; apothecia marginal and laminal (on the ridges of the faveolae); tomentum on the undersurface very dense, dark brown, protruding somewhat beyond the lobe margins and visible from above as a slight fringe; containing physciosporin (grey-black spot on charred t.l.c. plates)..... *P. faveolata*

References

Culberson, C.F. (1972). Improved conditions and new data for the identification of lichen products by a thin-layer chromatographic method. *Journal of Chromatography* **72**, 113–125.

Elix, J.A. and Ernst-Russel, K.D. (1993). 'A catalogue of standardized thin-layer chromatographic data and biosynthetic relationships for lichen substances.' 2nd edition (Australian National University: Canberra)

Feige, G.B., Lumbsch, H.T., Huneck, S. and Elix, J.A. (1993). The identification of lichen substances by a standardized high-performance liquid chromatographic method. *Journal of Chromatography* **646**, 417–427.

Galloway, D.J. (1988). Studies in *Pseudocyphellaria* (lichens) I. The New Zealand species. *Bulletin of the British Museum (Natural History), Botany Series* **17**, 1–267.

Galloway, D.J. (1992). Studies in *Pseudocyphellaria* (lichens) III. The South American species. *Bibliotheca Lichenologica* **46**, 1–275.

Galloway, D.J. (1994). Studies in *Pseudocyphellaria* (Lichens) IV. Palaeotropical species (excluding Australia). *Bulletin of the Natural History Museum (Botany Series)* **42**, 115–159.

Kantvilas, G. (1995). A revised key and checklist for the macrolichens in Tasmanian cool temperate rainforest. *Tasforests* **7**, 93–127.

Malcolm, W.M. and Galloway, D.J. (1997). 'New Zealand Lichens. Checklist, key and glossary.' (Museum of New Zealand Te Papa Tongarewa: Wellington.)